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Superior Trunk Block *versus* Interscalene Block: Comment

To the Editor:

We read with great interests the article "Superior Trunk Block: A Phrenic-sparing Alternative to the Interscalene Block: A Randomized Controlled Trial" by Kim *et al.*[1] The superior trunk block is a promising alternative to interscalene brachial plexus block with diaphragm-sparing. We appreciate the authors' great work, but we do have several concerns. First, the cutaneous innervation of shoulder is provided by brachial plexus and supraclavicular nerves which originate from superficial cervical plexus[2]; therefore, to carry out shoulder surgery solely with peripheral nerve blocks, brachial plexus block must be combined with superficial cervical plexus or supraclavicular nerve block to provide coverage for skin incision and closure.[3] In this study, consequent intravenous sedation was provided intraoperatively, but superficial cervical plexus, supraclavicular nerve block, or local anesthetic infiltration at the surgical sites was not performed. Second, the unit of grip strength measurement in this article was not provided. We speculate that the unit should be kilogram according to their previous study.[4] The grip strength after block was described as change from baseline in this article rather than proportion of baseline by Auyong *et al.*[5] We consider the latter description of grip strength a better strategy to make comparisons. According to their previous baseline data of grip strength, we speculate that the grip strength after interscalene plexus block was about 42% of baseline in this study, which is higher than 27% by Auyong *et al.*[5] It would be hard to preserve such a high proportion of baseline grip strength with 0.5% bupivacaine 15 ml deposited in between C5 and C6 nerve roots. Thirdly, there are existent studies by Aliste *et al.*[6,7] showing that targeting the brachial plexus causes a hemidiaphragmatic paralysis rate of less than 5%. Finally, it is illogical that under intravenous sedation, the intraoperative mean minute ventilation measurements have even increased in the superior trunk group compared with baseline.

Competing Interests

The authors declare no competing interests.

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Superior Trunk Block *versus* Interscalene Block: Reply

In Reply:

We thank the authors of the letter[1] for their thoughtful comments. Although supraclavicular nerve (C3, C4) block could provide additional coverage of the shoulder (cape), we have not found it necessary to supplement our superior trunk blocks[2] for surgical anesthesia for shoulder arthroscopy. Our shoulder surgeries are performed in the beach-chair position, and the anterior and lateral portal placements are located in the dermatomal boundaries provided by the axillary nerve (C5). Our surgeons routinely perform additional infiltration with 2% lidocaine (5 to 10 ml) for the posterior port, covering the region that neither the brachial plexus nor the superficial cervical plexus innervates.

The authors also mentioned other phrenic nerve–sparing approaches, namely the costoclavicular technique,[3] and the combination of infraclavicular and suprascapular nerve blocks.[4] However, these studies were conducted with the combination of general anesthesia and regional anesthesia, and both had small sample sizes (n = 44). Our block was performed without general anesthesia, and our sample size was nearly three times that in either study (n = 126). It would be of interest to investigate whether these other phrenic nerve–sparing blocks can provide sufficient surgical anesthesia as demonstrated for the superior trunk block in our study.

The authors are correct in pointing out that the dynamometer measurements should include a per-kilogram adjustment. We believe the reason for the preservation of hand strength with the superior trunk is attributed to the low volume of the block and the intentional targeting of only the C5/C6 distribution of the brachial plexus.

As for the increased minute ventilation intraoperatively in the superior trunk block group, it may seem counterintuitive at first glance and maybe related to a possibly inerrant measurement by the monitor used. However, it may have to do with the positioning of the patient. Preoperatively, our patients are fully awake and laying down during the measurement. Intraoperatively, our patients are in the beach chair position (60 to nearly 90 degrees incline), and postoperatively, our patients are positioned with the head elevated at 30 degrees. The different positions may be an explanation of the increase in minute ventilation intraoperatively, which markedly highlights the profound effect of a paralyzed diaphragm (interscalene group) on minute ventilation.

In summary, the criticisms are appreciated and we believe that more research on phrenic-sparing shoulder blocks is needed.

Competing Interests

The authors declare no competing interests.

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